

REMARKS

This is responsive to the Office Action mailed on September 27, 2007. With this Amendment, claims 1 and 2 have been amended, and the application continues to include claims 1-3.

In the Office Action, claims 1 and 2 are objected to because of the informality relating to the phrase "mobile objects". The Office Action states that since "mobile" was changed to moving in the claims, they should also be changed to "the moving objects". Claims 1 and 2 have been so amended.

The Office Action rejects claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over the Bakhtiari et al. U.S. Patent 5,886,534 in view of Gupta 3,852,743.

Upon further correspondence with the inventors through the undersigned Attorney's contact who is an employee of the Assignee, Applicant's Attorney has been told that the measurement being taken as discussed in the priority document is detection of vibrational movement of the rotor blade. This vibrational movement can be caused, for example, by a piece of the rotor being broken or other mechanical malfunctions. One problem in the English version of this application is the translation and the loss of meaning of the words from the Polish priority document to the English filed application. The undersigned Attorney discussed some of this issue in relation to the Polish word "ruchomych", which could be translated into several English words.

The undersigned Attorney now has a better understanding of the Polish priority document in view of the inventor's further explanation of the invention. The undersigned Attorney has a very rudimentary (about 4th grade level vocabulary) understanding of the Polish language, having spoken Polish as a child.

In particular, the translation of the clause from the second and third lines of the priority document, "przy pomiarze chwilowego położenia I przemieszczenia ruchomych elementów" is not accurate. The English translation of this Polish clause in this application is "during instantaneous measurement of position and shift of mobile elements..." (Appl'n Pg. 1, Line 6).

The actual translation of this clause should have been: "with measurement of the

moment (instantaneous) position and dislocation or displacement movement of the element". Although grammatically incorrect in English, it conveys that the position and shift of the element should be recognized as vibration, and not translatory movement of the element (rotor).

Independent claims 1 and 2 have been amended to state that the position and shift of the moving object was "instantaneous". The shifting of the element instantaneously with respect to position is vibration. Attached to this response are several definitions from dictionary.com as an exhibit to the word vibration. One relates to physics and defines vibration as the oscillating, reciprocating, or other periodic motion of ... body... from a position or state of equilibrium. As amended, claims 1 and 2 measure the position of the moving object and it's shift, instantaneously.

The specification has also been amended in line 6 moving the word "instantaneous" to modify "position and shift", instead of the word "measurement". It is believed that no new matter has been added.

In view of the amendment to claim 1 and 2, the invention is neither taught nor suggested by the combination of Bakhtiari and Gupta. As stated in the previous response, Gupta describes a doppler radar system that utilizes a doppler effect to measure the radial velocity of targets in the antenna's directional beam. Doppler effect shifts the received frequency up and down based on the radial velocity of the target in the beam, allowing for direct and accurate measurement of velocity. Doppler radar is not used to detect instantaneous position and shift of a moving object such vibrational movement. The Bakhtiari et al. patent measures properties of thin sheets of dielectric materials. The dielectric material, as indicated in figure 1c of Bakhtiari, is placed in a sample holder 14 to support the dielectrec sample 18. The dielectric sample is held within holder 14 and therefore is not moving. This combination neither teaches nor suggests a system that detects vibrational movement.

It is believed that the application is now in condition for allowance, and reconsideration allowance of all of the claims are respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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METHOD AND SYSTEM FOR GENERATION AND HOMODYNE DETECTION

TECHNICAL FIELD

5 This invention relates to generation and reception of microwave signals during instantaneous measurement of instantaneous position and shift of mobile elements especially of rotor units of working turbo-machines during true-time operation.

BACKGROUND

10 Accomplishment of already known method exploits the principle of synchronous reception described in "Microwave homodyne systems" by R.J. King, P. Peregrinius LTD, IEE London, 1978. According to this method, the part of power from one generator transmitted by separate microwave channel is compared in detector system with signal from slotted section.

15 Already known system contains Gunn diode seating connected through collinear arm with magic tee and then by second collinear arm with detection diode seating. Microwave antenna is connected to magnetic magic tee arm and comparative channel is connected to electric magic tee arm.

Both already known method and system make generation and homodyne
20 detection impossible in extremely hard environmental conditions with temperature reaching several hundred degrees centigrade and dynamic pressure as a vibro-acoustic noise reaching about 160 dB. Neither already known method nor system enables operational inspection in such environmental conditions.

SUMMARY OF THE INVENTION

25 The method of this invention comprises selection of equal value of both electrical channels between shunt arm in waveguide T-connection and generation diode in one collinear arm and in the second collinear arm between the same shunt arm and detection diode. This means compliance of condition of proper phase location between generation and detection elements.

The system in this invention includes coupling between generating diode seating and detection diode seating by waveguide T-connection (tee).

Method and system of this invention enables operational inspection in each environmental conditions and also enables extending interpretation
5 possibilities of the measurement results.

DETAILED DESCRIPTION

According to the method, for generation, transmission, reception, and homodyne detection in the range of microwave frequency it is important to ensure the selection of equal value of both electrical channels between shunt arm
10 in waveguide T-connection, and generated diode in one collinear arm, and in the second collinear arm between the same shunt arm and detection diode. That way a compliance condition of proper phase location between generation and detection elements is achieved which is requested for technical embodiment of a microwave homodyne set.

15 The system is shown in the Figure as a bloc diagram. Generation diode seating 1 is connected through collinear arm 2 with coaxial waveguide T-connection 3 and then by collinear arm 4 with detection diode seating 5. Microwave antenna 6 connected to shunt arm of waveguide T-connection 3 radiates and receives signal reflected from inspected object 7.

20 Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1. A method of generation and homodyne detection comprising selecting a length of electric path, wherein an equal value is selected of both electrical paths between shunt arm in waveguide T-connection and generated diode in one collinear arm, and in the second collinear arm between the same shunt arm and detection diode.

2. A generation and homodyne detection system containing generation Gunn diode seating connected with one collinear arm, and detection diode seating connected with the second collinear arm significant by waveguide T-connection between generation diode seating and detection diode seating.

METHOD AND SYSTEM FOR GENERATION AND HOMODYNE DETECTION

ABSTRACT OF THE DISCLOSURE

The invention solves the problem of generation and homodyne detection. Its main application refers to generation and reception of microwave signals during instantaneous measurement of position and shift of mobile elements especially of rotor units of working turbo-machines during true-time operation. The method based on the selection of equal value of both electrical channels between shunt arm in waveguide T-connection and generation diode in one collinear arm and in the second collinear arm between the same shunt arm and detection diode. The system contains generation diode seating connected through waveguide T-connection with detection diode seating.


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vibration

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vi·bra·tion [vahy-bray-shuh,n] [Pronunciation Key](#) - [Show IPA](#)
[Pronunciation](#)
-noun

1. the act of vibrating.
2. the state of being vibrated.
3. *Physics.*
 - a. the oscillating, reciprocating, or other periodic motion of a rigid or elastic body or medium forced from a position or state of equilibrium.
 - b. the analogous motion of the particles of a mass of air or the like, whose state of equilibrium has been disturbed, as in transmitting sound.
4. an instance of vibratory motion; oscillation; quiver; tremor.
5. a supernatural emanation, bearing good or ill, that is sensed by or revealed to those attuned to the occult.
6. Often, vibrations. *Informal.* a general emotional feeling one has from another person or a place, situation, etc.: *I usually get good vibrations from him.*

[Origin: 1645–55; 1965–70 for def. 6; < L *vibrātiōn-* (s. of *vibrātiō*).]

See [VIBRATE](#), [-ION](#)

—Related forms

vi·bra·tion·al, *adjective*
vi·bra·tion·less, *adjective*

[Dictionary.com Unabridged \(v 1.1\)](#)

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Vibration Analyzer

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PC software

www.datastick.com

Whole Body Vibration

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vi·bra·tion   (vī-brā'shən) [Pronunciation Key](#)

n.

1.

- a. The act of vibrating.
- b. The condition of being vibrated.
- c. A rapid linear motion of a particle or of an elastic solid about an equilibrium position.
- d. A periodic process.

2. *Physics*

- a. A rapid linear motion of a particle or of an elastic solid about an equilibrium position.
- b. A periodic process.

3. A single complete vibrating motion; a quiver.

4. *Slang* A distinctive emotional aura or atmosphere regarded as being instinctively sensed or experienced. Often used in the plural: "Miami gives off the same vibrations, the same portent of disaster, but with a difference" (James Atlas).

vi·bra·tion·al adj.

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Noise Vibration Analyzer

4 channels, handheld, FFT for modal ODS, balance, Data Collector, Meter
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vibration

1656, from L. *vibrationem* (nom. *vibratio*), from *vibratus* (see [vibrate](#)). Meaning "intuitive signal about a person or thing" was popular late 1960s, but has been recorded as far back as 1899.

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vibration

noun

1. the act of vibrating
2. a shaky motion; "the shaking of his fingers as he lit his pipe" [syn: [shaking](#)]
3. (physics) a regular periodic variation in value about a mean [syn: [oscillation](#)]

gave me bad vibrations"; "it gave me a nostalgic vibe"

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vi'bration [(British and American) '-breɪ-] *noun*

(an) act of vibrating

Example: *This building is badly affected by the vibration of all the heavy traffic that passes.*

Arabic: ارتعاش

Japanese: 振動

Chinese (Simplified): 振动

Korean: 진동; 동요

Chinese (Traditional): 振動

Latvian: vibrācija;

Czech: vibrace

trīcēšana;

Danish: vibration

drebēšana

Dutch: trilling

Lithuanian: vibracijā,

Estonian: vibratsioon

virpėjimas

Finnish: tärinä

Norwegian: risting,

French: vibration

sitrung,

German: die

vibrering

Vibration

Polish: drgańie,

Greek: δόνηση,
κραδασμός

Portuguese (Brazil): vibração

Hungarian: rezgés

Portuguese (Portugal): vibração

Icelandic: titringur,

Romanian: vibrație

skjálfati

Indonesian: getaran

Russian: вибрация

Italian: vibrazione

Slovak: vibrácia

Slovenian: tresenje

Spanish: vibración

Swedish: vibration

Turkish: titreme

See also: [vibrate](#)

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vibration (vī-brā'shən) [Pronunciation Key](#)

A rapid oscillation of a particle, particles, or elastic solid or surface, back and forth across a central position.

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Main Entry: **vi·bra·tion**

Pronunciation: vī- 'brā-sh&n

Function: noun

1 a : a periodic motion of the particles of an elastic body or medium in alternately opposite directions from the position of equilibrium when that equilibrium has been disturbed (as when particles of air transmit sounds to the ear) b : the action of vibrating : the state of being

2 : an instance of vibration —*vi·brate* /'vI-ə-brət/ *verb vi·brat·ed; vi·brat·ing*
—*vi·bra·tion·al* /-shnəl, -sh&n-əl/ *adjective*

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